CLAIMS

1. A method for determining a target exhaust temperature for a gas turbine comprising:

a. determining a target exhaust temperature based on a compressor pressure condition;

b. determining a temperature adjustment to the target exhaust temperature based on at least one parameter of a group of parameters consisting of specific humidity, compressor inlet pressure loss and turbine exhaust back pressure; and

c. adjusting the target exhaust temperature by applying the temperature adjustment.

2. A method as in claim 1 wherein determining the temperature adjustment is based on a schedule having a delta specific humidity input and a delta exhaust temperature output, wherein the delta specific humidity input is a difference between an actual specific humidity at an inlet to the gas turbine and a predefined specific humidity level, and the delta exhaust temperature output is a temperature difference to be summed with the target exhaust temperature in step (c).

3. A method as in claim 1 wherein determining the temperature adjustment is based on a schedule having inputs of delta inlet pressure loss and the current compressor condition, and an output of a delta exhaust temperature output, wherein the delta inlet pressure loss input is a difference between an actual inlet pressure loss to the gas turbine and a predefined inlet pressure loss level, and the delta exhaust temperature output is a temperature difference to be summed with the target exhaust temperature in step (c).

4. A method as in claim 1 wherein determining the temperature adjustment is based on a schedule having inputs of delta back pressure and the current compressor condition, and an output of a delta exhaust temperature output, wherein the delta back pressure input is a difference between an actual back pressure to the gas turbine and a predefined back pressure level, and the delta exhaust temperature output is a temperature difference to be summed with the target exhaust temperature in step (c).

5. A method as in claim 1 further comprising repeating steps (a) to (c) to generate a plurality of the target exhaust temperatures, and selecting one of the plurality of target exhaust temperatures to be applied to control the gas turbine.

6. A method as in claim 1 wherein the target exhaust temperature is applied by a gas turbine controller to determine a turbine firing temperature.

7. A method as in claim 1 wherein the target exhaust temperature is applied by a gas turbine controller to determine a fuel flow to a combustor of the gas turbine.

8. A method as in claim 1 wherein the compressor pressure condition is compressor pressure ratio.

9. A method as in claim 1 wherein steps (a) to (c) are repeated periodically during operation of the gas turbine.

10. A method for determining a target exhaust temperature for a gas turbine comprising:

a. determining a target turbine exhaust temperature based on a compressor schedule having as an

input compressor pressure ratio and as an output target turbine exhaust;

b. adjusting the output target turbine exhaust temperature to compensate for a load condition of the gas turbine;

c. determining a temperature change to be applied to the output target turbine exhaust temperature wherein the temperature change is derived from at least one parameter of a group of parameters consisting of specific humidity, compressor inlet pressure loss and turbine exhaust back pressure;

d. changing the target exhaust temperature by the temperature change, and

e. controlling the gas turbine based on the changed target exhaust temperature.

11. A method as in claim 10 wherein determining the temperature change is based on a schedule having a delta specific humidity input and a delta exhaust temperature output, wherein the delta specific humidity input is a difference between an actual specific humidity at an inlet to the gas turbine and a predefined specific humidity level, and the delta exhaust temperature output is a temperature difference summed with the adjusted target turbine exhaust temperature in step (c).

12. A method as in claim 10 wherein determining the temperature change is based on a schedule having inputs of delta inlet pressure loss and the current compressor condition and an output of a delta exhaust temperature output, wherein the delta inlet pressure loss input is a difference between an actual inlet pressure loss to the gas turbine and a predefined inlet pressure loss level,

and the delta exhaust temperature output is summed with target turbine exhaust prior to step (b).

13. A method as in claim 10 wherein determining the temperature change is based on a schedule having inputs of delta back pressure and the current compressor condition, and an output of a delta exhaust temperature output, wherein the delta back pressure input is a difference between an actual back pressure to the gas turbine and a predefined back pressure level, and the delta exhaust temperature output is summed with target turbine exhaust prior to step (b).

14. A method as in claim 10 further comprising repeating steps (a) to (d) to generate a plurality of the target turbine exhaust temperatures, and selecting one of the plurality of target turbine exhaust temperatures to be applied to control the gas turbine.

15. A method as in claim 10 wherein the target turbine exhaust temperature is applied by a gas turbine controller to determine a turbine firing temperature in step (e).

16. A method as in claim 10 wherein the target turbine exhaust temperature is applied by a gas turbine controller to determine a fuel flow to a combustor of the gas turbine.

17. A method as in claim 10 wherein the compressor pressure condition is compressor pressure ratio.

18. A method as in claim 10 wherein steps (a) to (e) are repeated periodically during operation of the gas turbine.

19. A controller in a gas turbine having a compressor, combustor and turbine, said controller comprising:

a sensor input receiving data regarding an actual turbine exhaust temperature, a compressor pressure ratio level, a compressor pressure inlet loss, a turbine back pressure level and ambient humidity;

a processor executing a program stored in the controller, wherein said program further comprises: a compressor schedule for generating a first target exhaust temperature based on the compressor pressure ratio level, and at least one additional schedule for generating a temperature change to be applied to the first target turbine exhaust temperature wherein the temperature change is derived from at least one parameter of a group of parameters consisting of specific humidity, compressor inlet pressure loss, and the turbine back pressure level, and wherein said processor outputs a modified target exhaust temperature based on the first target exhaust temperature and the temperature change, and

a combustion controller which outputs a combustor control signal based on the modified target exhaust temperature.

20. A controller as in claim 19 wherein the at least one additional schedule includes a humidity verses delta target exhaust temperate schedule having an input indicative of the ambient humidity.

21. A controller as in claim 19 wherein the at least one additional schedule includes a compressor inlet pressure loss verses delta target exhaust temperate schedule having inputs indicative of the compressor pressure ratio level and the compressor pressure inlet loss.

22. A controller as in claim 19 wherein the at least one additional schedule includes a turbine back

pressure verses delta target exhaust temperate schedule having inputs indicative of the compressor pressure ratio level and the back pressure level.